

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method for detecting or selecting a dopaminergic neuron and/or a progenitor cell thereof, wherein the method comprises the step of contacting a cellular sample potentially comprising a dopaminergic neuron and/or a progenitor cell thereof with a polynucleotide that hybridizes under the washing conditions of 0.2x SSC and 0.1% SDS at 65°C to a polynucleotide comprising the nucleotide sequence of SEQ ID NO: 13, 15, or 17, wherein the cellular sample comprises cells from the ventral midbrain of an animal, stringent conditions to a transcript of a gene that consists of a nucleotide sequence of any one of (1) to (6);
  - (1) the nucleotide sequence of SEQ ID NO: 13;
  - (2) a nucleotide sequence encoding a polypeptide consisting of the amino acid sequence of SEQ ID NO: 14;
  - (3) a nucleotide sequence that hybridizes under stringent conditions to a gene consisting of the nucleotide sequence of SEQ ID NO: 13;
  - (4) the nucleotide sequence of SEQ ID NO: 15 or 17;
  - (5) a nucleotide sequence encoding a polypeptide consisting of the amino-acid sequence of SEQ ID NO: 16 or 18; and
  - (6) a nucleotide sequence that hybridizes under stringent conditions to a gene consisting of the nucleotide sequence of SEQ ID NO: 15 or 17.

2-8. (Cancelled)

9. (Currently Amended) A method for detecting or selecting a dopaminergic neuron and/or a progenitor cell thereof, wherein the method comprises the steps of:

(a) contacting a cellular sample potentially comprising a dopaminergic neuron and/or a progenitor cell thereof that comprises cells from the ventral midbrain of an animal with a polynucleotide that hybridizes under the washing conditions of 0.2x SSC and 0.1% SDS at 65°C to a polynucleotide comprising the nucleotide sequence of SEQ ID NO: 13, 15, or 17, and stringent conditions to a transcript of a gene that consists of a nucleotide sequence from any one of (a-1) to (a-6):

- \_\_\_\_ (a-1) the nucleotide sequence of SEQ ID NO: 13;
- \_\_\_\_ (a-2) a nucleotide sequence encoding a polypeptide consisting of the amino acid sequence of SEQ ID NO: 14;
- \_\_\_\_ (a-3) a nucleotide sequence that hybridizes under stringent conditions to a gene consisting of the nucleotide sequence of SEQ ID NO: 13;
- \_\_\_\_ (a-4) the nucleotide sequence of SEQ ID NO: 15 or 17;
- \_\_\_\_ (a-5) the nucleotide sequence encoding a polypeptide consisting of the amino acid sequence of SEQ ID NO: 16 or 18; and
- \_\_\_\_ (a-6) a nucleotide sequence that hybridizes under stringent conditions to a gene consisting of the nucleotide sequence of SEQ ID NO: 15 or 17; and

(b) contacting [[a]] the cellular sample potentially comprising a dopaminergic neuron and/or a progenitor cell thereof with a polynucleotide that hybridizes under stringent conditions to transcripts of one or more genes with one or more polynucleotides or one or more antibodies, wherein the polynucleotide hybridizes under the washing conditions of 0.2x SSC and 0.1% SDS at 65°C to a polynucleotide that encodes a protein selected from the group consisting of Lmx1b, Nurr1, En1, Ptx3, and TH, or with an antibody that binds to translation products of said selected genes and wherein the antibody binds to the protein.

10. (Currently Amended) The method of claim 9, which further comprises the step of:

(c) contacting a cellular sample potentially comprising the dopaminergic neuron and/or the progenitor cell thereof with a polynucleotide that hybridizes under stringent conditions to transcripts of either or both of the genes with one or more polynucleotides or one or more

antibodies, wherein the polynucleotide hybridizes under the washing conditions of 0.2x SSC and 0.1% SDS at 65°C per wash to a polynucleotide that encodes a protein selected from DAT and ADH2 or with an antibody that binds to a translation product of a said selected gene and wherein the antibody binds to the protein.

11. (Currently Amended) The method of claim 9, wherein the gene selected in step (b) is one or more of the protein is selected from the group consisting of Lmx1b, Nurr1, or and En1.

12. (Currently Amended) A method for detecting or selecting a dopaminergic neuron and/or a progenitor cell thereof, wherein the method comprises the steps of:

(a) contacting a cellular sample potentially comprising a dopaminergic neuron and/or a progenitor cell thereof that comprises cells from the ventral midbrain of an animal with a polynucleotide that hybridizes the washing conditions of 0.2x SSC and 0.1% SDS at 65°C to a polynucleotide comprising the nucleotide sequence of SEQ ID NO: 13, 15, or 17, and under stringent conditions to a transcript of a gene that consists of a nucleotide sequence from any one of (a-1) to (a-6):

- \_\_\_\_ (a-1) the nucleotide sequence of SEQ ID NO: 13;
- \_\_\_\_ (a-2) a nucleotide sequence encoding a polypeptide consisting of the amino-acid sequence of SEQ ID NO: 14;
- \_\_\_\_ (a-3) a nucleotide sequence that hybridizes under stringent conditions to a gene consisting of the nucleotide sequence of SEQ ID NO: 13;
- \_\_\_\_ (a-4) the nucleotide sequence of SEQ ID NO: 15 or 17;
- \_\_\_\_ (a-5) a nucleotide sequence encoding a polypeptide consisting of the amino-acid sequence (human) of SEQ ID NO: 16 or 18; and
- \_\_\_\_ (a-6) a nucleotide sequence that hybridizes under stringent conditions to a gene consisting of the nucleotide sequence of SEQ ID NO: 15 or 17; and

(b) contacting [[a]] the cellular sample potentially comprising a dopaminergic neuron and/or a progenitor cell thereof with a polynucleotide that hybridizes under stringent conditions to transcripts of either or both of the genes with one or more polynucleotides or one or

more antibodies, wherein the polynucleotide hybridizes under the washing conditions of 0.2x SSC and 0.1% SDS at 65°C to a polynucleotide that encodes a protein selected from the group consisting of DAT and ADH2, or with an antibody that binds to translation products of said selected genes and wherein the antibody binds to the protein.

13-26. (Canceled)

27. (New) A method for detecting or selecting a dopaminergic neuron and/or a progenitor cell thereof, wherein the method comprises the step of contacting a cellular sample with a polynucleotide comprising the complementary sequence of:

- (1) the nucleotide sequence of SEQ ID NO: 13;
- (2) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 14;
- (3) the nucleotide sequence of SEQ ID NO: 15 or 17; or
- (4) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 16 or 18;

wherein the cellular sample comprises cells from the ventral midbrain of an animal.

28. (New) A method for detecting or selecting a dopaminergic neuron and/or a progenitor cell thereof, wherein the method comprises the steps of:

- (a) contacting a cellular sample that comprises cells from the ventral midbrain of an animal with a polynucleotide comprising the complementary sequence of:
  - (1) the nucleotide sequence of SEQ ID NO: 13;
  - (2) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 14;
  - (3) the nucleotide sequence of SEQ ID NO: 15 or 17; or
  - (4) the nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 16 or 18; and

(b) contacting the cellular sample with one or more polynucleotides or one or more antibodies, wherein the complementary sequence of each of the polynucleotides encodes a protein selected from the group consisting of Lmx1b, Nurr1, En1, Ptx3, and TH, and wherein each of the antibodies binds to the protein selected from said group.

29. (New) The method of claim 28, which further comprises the step of:

(c) contacting the cellular sample with one or more polynucleotides or one or more antibodies, wherein the complementary sequence of each of the polynucleotides encodes a protein selected from DAT and ADH2, and wherein each of the antibodies binds to the protein selected from said group.

30. (New) The method of claim 28, wherein the protein in step (b) is selected from the group consisting of Lmx1b, Nurr1, and En1.

31. (New) A method for detecting or selecting a dopaminergic neuron and/or a progenitor cell thereof, wherein the method comprises the steps of:

(a) contacting a cellular sample that comprises cells from the ventral midbrain of an animal with a polynucleotide comprising:

(1) the nucleotide sequence of SEQ ID NO: 13;

(2) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 14;

(3) the nucleotide sequence of SEQ ID NO: 15 or 17; or

(4) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 16 or 18; and

(b) contacting the cellular sample with one or more polynucleotides or one or more antibodies, wherein the complementary sequence of each of the polynucleotides encodes a protein selected from the group consisting of DAT and ADH2, and wherein each of the antibodies binds to the protein selected from said group.